

# Alternate Target Engagement Techniques

By: Michael Haugen

Before we can discuss various sighting techniques we must first discuss the terms that are used.

Definitions:

Trajectory: the path that a projectile follows to a terminal point.

Rising Branch: The upward flight of a projectile along the trajectory effected by velocity and elevation of the weapon.

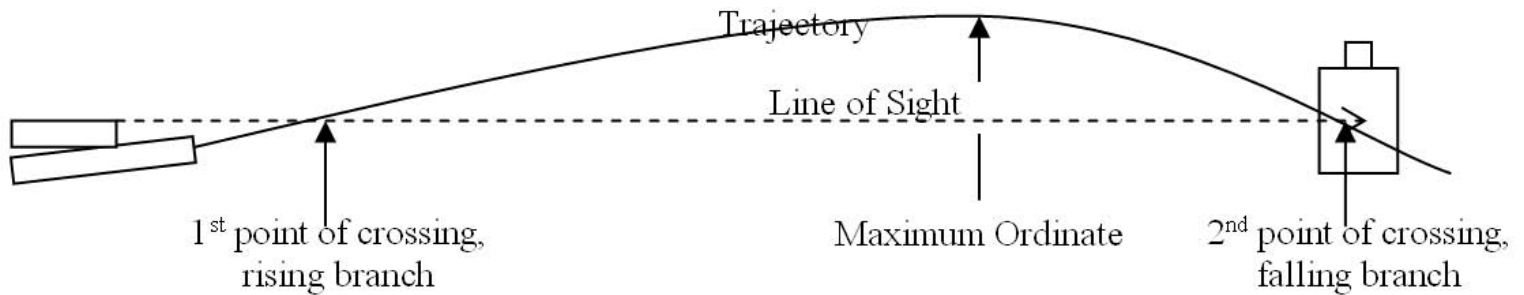
Maximum Ordinate: The highest point obtained by a projectile along the trajectory.

Falling Branch: The downward flight of a projectile along the trajectory effected by gravity.

The first target engagement technique is Point Blank Zero or PBZ. Point Blank Zero or PBZ also referred to as Point Blank Range (PBR) is that range for a given cartridge, environmental conditions and elevation that the maximum ordinate of the trajectory does not rise or fall outside the dimensions of the desired kill zone of the target.

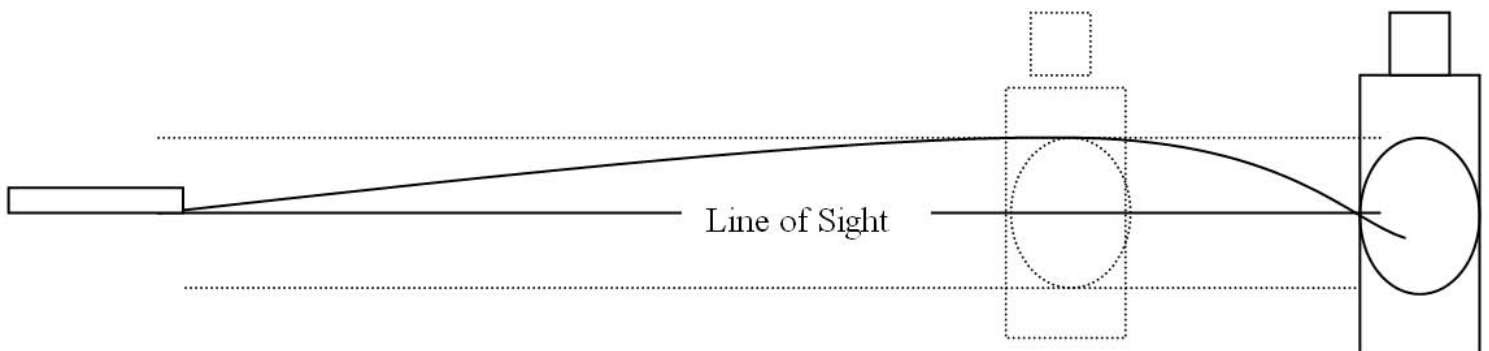
Hunters use this technique all the time. At the beginning of the season the hunter zeros his rifle at a set distance. He knows through experience that should a deer appear anywhere from his muzzle to the range he zeroed he can engage it without altering his point of aim. What this means to a sniper is that he can index a specific elevation on his weapon and engage targets out to a certain range without having to make any elevation changes. For a military sniper using a rifle chambered for .308 (7.62mm x 51mm) he can set the elevation to 300 meters and engage targets from the muzzle out to approximately 375 meters without changing his point of aim (POA) (when aiming center mass) or his elevation and strike the target within (+/-) 6 inches of that POA. This is very effective and useful when conducting defensive, offensive or retrograde operations.

In order to understand PBZ one must understand ballistics and trajectories. A bullet does not fly straight to the target, rather it establishes an arc rising from the muzzle (rising branch) to an apex approximately 2/3 of the distance to the target and then falls towards earth (falling branch). In longer ranges, the bullet will pass the line of sight on both the rising branch and falling branch. See Figure 1.



**Figure 1.**

PBZ is taught by military sniping schools by a defined range and elevation. However, this technique can be adapted using any range/elevation.



**Figure 2.**

From figure 2 above you can see that the PBZ runs from the muzzle to the target. In reality it would run past the target a short distance depending on range and elevation. Shorter ranges will have the PBZ as depicted above, whereas longer ranges will have an area that can be used as a PBZ on the front and back end of the trajectory. When there is an area on the front and rear of a trajectory that the round does not rise above or fall below the kill zone, it is referred to as Danger Space. Danger Space and PBZ are technically two different things however both can have the same use. They allow the shooter to affect targets using the trajectory of projectile without changing his elevation. Danger Space will be discussed shortly.

Shooters can use this technique with any elevation/range combination by knowing what the maximum ordinate (max ord) is of the chosen round at any given range. Examples of this for the .308/7.62 NATO are the 300-meter PBZ and the 500-meter PBZ. For the 500-meter PBZ, the shooter indexes 500 meters on his sights, the 7.62 has a max ord of 2.4901 feet along this trajectory. So the shooter knows the if he has 500 meters indexed on his gun and a target appears at 375 meters if he holds center the round should impact approximately 2.5 feet or 30 inches (approx. 10 MOA) high. So looking at the target the shooter can instantly hold the waist or crotch and shoot the target. Also, should a target appear past 500 meters but closer than 600 meters the shooter can just hold neck/head and fire. About this point most people are probably thinking, "this is just Kentucky Windage". That's exactly what this is only with more science applied.

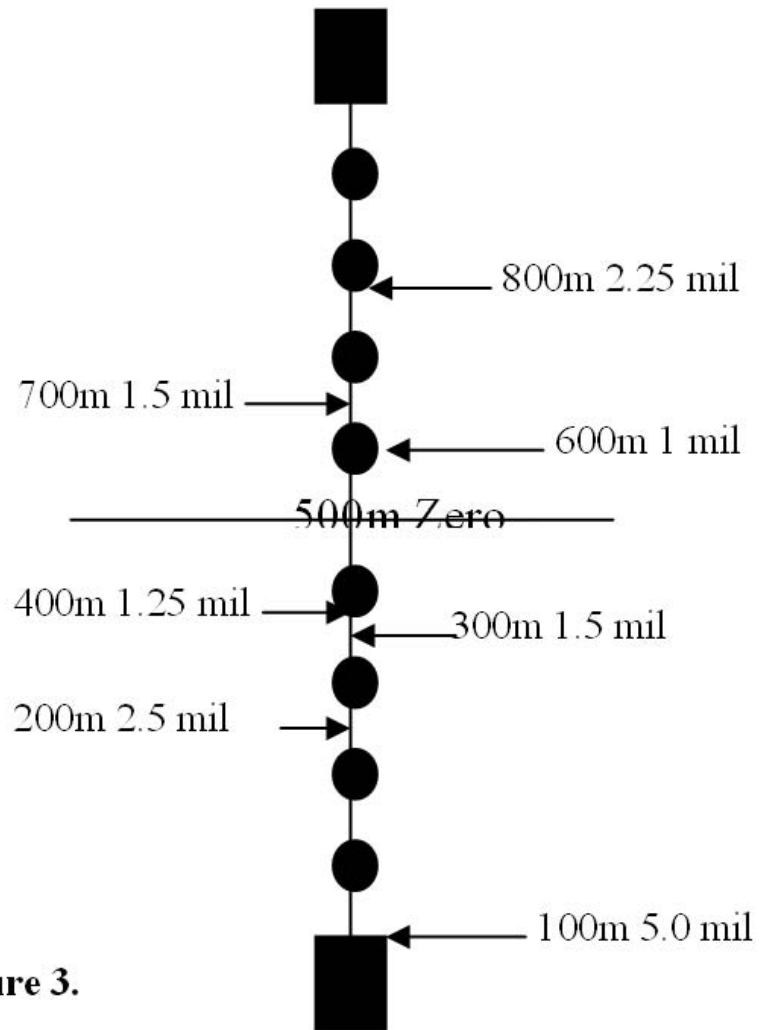
Another alternate target engagement technique is Mil Hold Offs. This technique uses the same principles as PBZ but the shooter is compensating for range adjustments through the mil dots. Figure 3 shows Hold Offs and how they are used.

Its must be noted mil hold offs are NOT very accurate. This is especially true at ranges over 600 meters. The 700-meter and the 800-meter hold off should only be used in an emergency. However, when there isn't time to mil/range the target/s or there are many targets, mil hold offs can prove to be very effective in the suppression of targets.

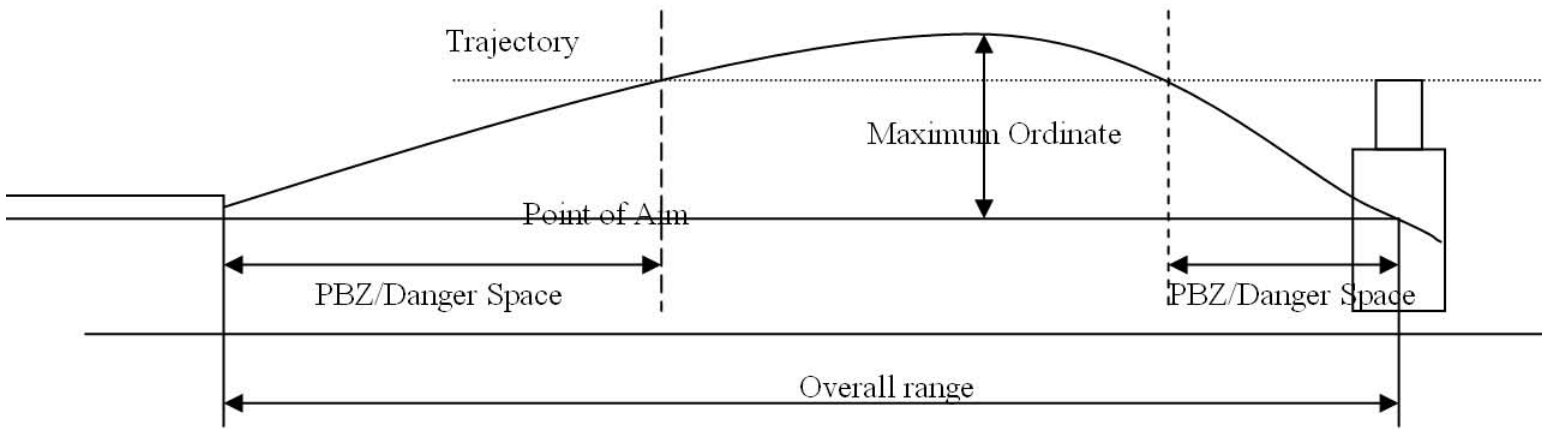
The next technique is Danger Space. This like many aspects of long range shooting is usually misunderstood and rarely used. As stated, Danger Space (DS) is that point along a trajectory, which the path of the bullet does not rise above or fall below the kill zone of the target. What DS really equates to is the range error that is affordable when estimating range to the target. If the shooter sees a target that he believes to be around 700 meters, he must correctly estimate that range to within 38 meters of the actual range. Meaning that if he decides through the use of mil dots or laser range finder, etc that the actual distance to the target is 700 meters but it is actually 650 meters (+/- 34.5 meters, DS for 650) he will completely miss the target, the round will go over its head. This makes the spotters job that much harder as he probably won't see the splash or trace. The point here is that the shooter must know what his DS is. He can use it to his advantage. Where this really comes into affect is that it allows the shooter/spotter to spend less time arguing about the actual range to the target.

There are basically two easy ways to find out what the Danger Space is. The first is to acquire pre-printed data that identifies the DS. The next method is to purchase one of the programs currently being sold that will calculate the DS for you.

The key point to any of these methods is accurate range estimation. Without this the shooter has no way to know if he will



**Figure 3.**



**Figure 4.**

be able to hit the target or not. Another thing that should be noted is that if you are shooting at longer ranges (500 and beyond) just take the time to accurately estimate the range, dial it on and engage the target. Notice that none of the above techniques dealt with wind corrections, this is another factor that will greatly affect hit probability.

Lastly, every technique requires practice and experience. You cannot gain either through reading books and/or articles on the subject you must shoot. So, save your money and buy ammunition, go out to a range every opportunity you get and shoot. Remember QUALITY NOT QUANTITY.